

**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Masayuki KAMON et al.

Group Art Unit: 3682

Application No.: 10/689,995

Examiner: J. PILKINGTON

Filed: October 22, 2003

Docket No.: 117589

For: ARTICULATED MANIPULATOR

**REPLY BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The following remarks are directed to the new points of argument raised in the Examiner's Answer dated September 4, 2008.

Claims 8-10 are on appeal and claims 1-7 have been canceled. Claims 8-10 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Takagi (JP U 4-115592), and the Examiner has maintained his rejections of the claims in the Examiner's Answer.

The Examiner's theories as to how the reference allegedly describes the articulated manipulator of the present claims set forth in the Examiner's Answer are inaccurate and do not support a conclusion of obviousness.

**I. The Arrangement Of Links And Joints Is Non-Obvious**

In the Examiner's Answer, the Examiner stated that "Rearranging the links of Takagi would not change how the arm operates...The only change would be the work area and the axis intersection points of the axes of the links" (see page 6, paragraph C of the Examiner's Answer). This is incorrect.

For example, as was detailed on pages 16-17 of the Brief on Appeal, the particular arrangement defined in the present claims achieves a common triaxial intersection point among the rotational axis of the coaxial joint between the fourth and fifth links, the diagonal link between the fifth and sixth link and the terminal portion of the sixth link (see page 16, lines 12-15 of the Brief on Appeal and Fig. 3 of the specification). The arrangement providing this triaxial intersection point solves the problem of needing to determine inverse conversions for calculation of rotational angles based on the position and orientation of a terminal device. Accordingly, this simplifies the operation of the articulated manipulator of the present claims.

The Examiner has completely ignored this feature of claim 8, and has not addressed how Takagi could have rendered obvious this feature and the benefits associated therewith.

Thus, the Examiner's statement that even if the links were rearranged, Takagi "would still be driven in the same manner ..." is clearly incorrect. Takagi does not describe a coaxial joint between the fourth, fifth and sixth links. Thus, Takagi does not address the problem of needing to determine inverse conversions for calculation of rotational angles based on the position and orientation of the terminal device. Takagi cannot achieve the triaxial intersection point of the present claims and would not be driven in the same manner as if the links were arranged in the manner of claim 8, achieving the triaxial intersection point.

**II. Takagi Provides No Reason Or Rationale For One Of Ordinary Skill In The Art To Reach The Features of The Present Claims**

In the Examiner's Answer, the Examiner makes several statements allegedly supporting the finding of obviousness.

First, the Examiner makes the conclusory statement that "since all the links are known, a particular arrangement of the links would indeed be obvious to one having ordinary skill in the art" (see page 5, lines 2-4 of the Examiner's Answer). This is incorrect, and does not provide the necessary reason or rationale for one of ordinary skill in the art to have found the present claims obvious.

As argued in the Brief on Appeal, one of ordinary skill in the art would not have had a reason or rationale to have rearranged the robot arm of Takagi as alleged by the Examiner. The prior art must provide a reason for the worker in the art, without the benefit of Appellant's specification, to make the necessary changes in the reference device, as stated in *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). See also MPEP §2144(VI)(C). The Examiner's statement provides no reason or rationale for one to have rearranged Takagi's design to have arrived at the claimed arrangement.

Second, the Examiner alleged that the possible arrangement of links is not infinite, but rather because only mating surfaces can be connected to each other, the number of possible outcomes in the arrangement is allegedly finite. This is incorrect. One of ordinary skill in the art attempting to modify Takagi would have been faced with a choice of adding or rearranging an innumerable number of links or joints. The mere fact that coaxial joints must be mated to other coaxial joints and angled joints mated to other angled joints does not somehow limit the number of arrangements. Even if it is considered to limit the arrangements possible, the number is clearly not reduced to such a few number of possibilities that one would have considered the number "finite" or could have been led to the specific arrangement

recited in claim 8. Contrary to the Examiner's allegations, there are thus an infinite number of possible arrangements of the links and joints of Takagi.

Regardless, in attempting to allege that the possible arrangements of links and joints is finite, the Examiner apparently attempts to rely on the so-called "obvious to try" standard of obviousness. As summarized in *KSR* and MPEP §2143.E, this requires a finding (1) that at the time of the invention, there was a recognized problem or need in the art, (2) that there had been a finite number of identified, predictable potential solutions to the recognized problem or need, (3) one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success and (4) other findings based on the *Graham* factual inquiries that may be necessary to explain a conclusion of obviousness. The Examiner has not set forth the necessary findings for this obviousness analysis. Nowhere are the number of potential number of solutions established to be finite, as above, nor has it been established that the solutions are identified and predictable from Takagi. As above, the presently claimed arrangement achieves unexpected benefits, e.g., because of the presence of the triaxial intersection point, and thus clearly the various possible arrangements are not identified or predictable. The Examiner has not established any reason or rationale supporting the rejection under this obviousness theory.

There is also nothing in Takagi that would have led one to have specifically chosen the combination of links and joints recited in claim 8. The figures of Takagi show that in order to modify the motion of the robot arm, one must add links or joints (see Fig. 5 of Takagi). The combination of links or joints added, shown in Fig. 5 of Takagi, does not describe the combination of links and joints present in claim 8. There is no reason or rationale present in Takagi to have led one of ordinary skill in the art to have arranged the links and joints in the specific manner recited in claim 8.

Third, in the Examiner's Answer, the Examiner also attempts to cite Appellant's specification as allegedly supporting the obviousness finding. Specifically, the Examiner notes that the specification states "Although the invention has been described in its preferred embodiments with a certain degree of particularity...the invention may be practiced otherwise than as specifically described herein without departing from the scope and spirit thereof." See page 27 of the specification. The Examiner alleges that this phrase supports the finding of obviousness for the arrangement of links and joints recited in claim 8. Appellant respectfully disagrees.

The above passage at the end of the specification clearly states that the invention may be practiced in other ways if not departing from the "scope and spirit" of the claims. This does not mean all arrangements are within the scope and spirit of the claims. To the contrary, arrangements such as Takagi that do not include the required triaxial intersection point, as detailed above, clearly depart from the scope and spirit of the claims. Thus, as Takagi does not have a triaxial intersection point, nor does it provide any reason or rationale for one skilled in the art to create one, Takagi could not have rendered obvious all of the features of claim 8.

Further, the Examiner's need to try and cite to the above "boilerplate" type passage indicates the clear weakness in the obviousness allegation, the Examiner grasping at Appellant's own specification in an effort to bolster an inadequate analysis. Clearly, Appellant's specification does not provide support for the obviousness allegation over Takagi, and thus the Examiner's reasoning fails to establish obviousness over Takagi.

Finally, in the Examiners Answer, the Examiner also alleged that *KSR* has foreclosed the argument that a specific teaching, suggestion, or motivation (TSM) is required to support a finding of obviousness. See page 5, lines 12-14 of the Examiner's Answer. This allegation by the Examiner is both legally and factually incorrect.

Appellant did not argue that Takagi lacked a specific teaching, suggestion, or motivation in the Brief on Appeal. Instead, Appellant argued that "One of ordinary skill in the art would have had no reason or rationale to have made the necessary changes in the robot arm of Takagi, to arrive at the articulated manipulator of claim 8." See page 13, lines 10-12 of the Brief on Appeal. This broader reason or rationale basis was set forth in *KSR*, and is outlined in MPEP §2143.

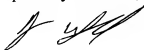
Furthermore, *KSR* did not foreclose the TSM test, but in fact endorsed it as one of many possible reasons or rationales that may support a finding of obviousness. The MPEP correctly recognizes TSM as a valid obviousness test, just not as the only test. See MPEP §2143.G.

In conclusion, MPEP §2144(VI)(C) clearly explains that the mere fact that a worker in the art could rearrange the parts of the reference device is not by itself sufficient to support a finding of obviousness. The prior art must provide a reason for the worker in the art to make the necessary changes to the reference device. For all the reasons above, it is clear the Examiner has failed to provide any of the necessary reasoning or rationale that might support obviousness, and instead rests on the blanket allegation that all arrangements, including that of claim 8, are obvious because links and joints are known. This analysis is insufficient to support a proper finding of obviousness, and the rejection therefore must be withdrawn.

**III. Conclusion**

For all the reasons stated in the Brief on Appeal, as well as the additional reasons set forth above, Appellant respectfully requests this honorable Board to reverse the rejection of claims 8-10.

Respectfully submitted,



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JAO:ABW/tca

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